Message from the Guest Editor

Dear Colleagues,

Space robotics has evolved from a mere addendum to the space exploration programme to a fully-fledged strategic capability that leverages the entire programme. Examples of the traditional concerns of space robotics include on-orbit servicing using spacecraft-mounted manipulators, terramechanics and autonomous navigation for planetary rovers and robotic drilling mechanisms. More recently, autonomous science for rovers has emerged as a capability for rovers to complement navigational autonomy in rovers. Biomimetics also has a role to play in space robotics such as in automated camera control for example. Some traditional areas have evolved - on-orbit servicing capabilities are being applied to space debris mitigation with new approaches such as harpooning and netting. Recent interest in in-situ resource utilisation (ISRU) specifically requires extensive robotics capabilities ranging from asteroid and lunar mining, 3D printing (essentially Cartesian robotics) and even self-replicating machines to leverage local resources to reduce the costs of space exploration and for supporting lunar or Martian bases. Artificial intelligence techniques are percolating into the spacecraft for spacecraft control and scheduling and autonomous ground stations. Despite this, there has been reluctance to engage in soft computing techniques for space exploration – recent developments in such methods have extensive applicability to space exploration. This will require a culture change in space engineering to admit these new powerful techniques. This Special Issue will be exploring these and other aspects of space robotics as it becomes entrenched as a core part of mainstream space technology.

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Message from the Editor-in-Chief

It is my great pleasure to welcome you to our open access journal, Robotics, which is dedicated to both the foundations of artificial intelligence, bio-mechanics and mechatronics, and the real-world applications of robotic perception, cognition and actions. The 21st century is the robotics century and intelligent robots will change our lifestyle forever. Let us work together toward the realization of intelligent robots step by step.

It is great fun to create intelligent robots and imagine their practical applications. Robotics is now ready to serve you in the long journey towards such a goal.

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